



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/733,943	12/12/2000	James Korein	112792-701	5147

27160 7590 07/19/2004

PATENT ADMINSTRATOR  
KATTEN MUCHIN ZAVIS ROSENMAN  
525 WEST MONROE STREET  
SUITE 1600  
CHICAGO, IL 60661-3693

EXAMINER

LUU, THANH X

ART UNIT PAPER NUMBER

2878

DATE MAILED: 07/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/733,943

Applicant(s)

KOREIN, JAMES

Examiner

Thanh X Luu

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the convex surface and the incoherent configuration must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 29 and 30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. It is unclear to one of ordinary skill in the art how to provide a computer readable set of instructions or lookup tables that invert mapped images conveyed through the cable.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2878

5. Claims 1-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, it is unclear how an image and a sensor of the preamble are related to an image and a sensor of the body of the claim.

Regarding claim 2, it is unclear how pixels are functionally related to the rest of the invention.

Regarding claim 3, "each individual pixel" lacks proper antecedent basis.

Regarding claim 6, "the form of said image" lacks proper antecedent basis.

Furthermore, it is unclear how an image has a "form."

Regarding claim 7, it is unclear in its given context what "any subset thereof" may consist of.

Regarding claim 8, "the form of an image sensor" lacks proper antecedent basis. Further, it is unclear if "an image sensor" refers to the previous image sensor or how many image sensors are being claimed.

Regarding claims 23-26, "said at least one or more mirrors" lacks proper antecedent basis.

Regarding claim 29, "mapped images" lacks proper antecedent basis.

Regarding claim 33, it is unclear how a sensor chip is related to the sensor previously claimed.

Regarding claim 34, "each rectangular end" lacks proper antecedent basis. Further, it is unclear how a sensor or sensor element is related to the sensor or sensor

elements previously claimed.

Regarding claims 35 and 36, "each generated image" or "each conveyed image" lacks proper antecedent basis because it implies that there are plural images.

Regarding claims 37 and 38, "the fiber bundle" lacks proper antecedent basis as it appears that Applicant also uses the terms "said non-tapered bundle" to refer to the same bundle.

Regarding claim 39, it is unclear in its given context how "a fiber optic bundle" is functionally related to the bundle of optical fibers in claim 35.

Regarding claims 40 and 41, it is unclear if the multiple instances of "a non-planar image" refer to the same image or a different image.

Regarding claim 40, "the second end" lacks proper antecedent basis. Further, Applicant uses "the cable" and "said optical fiber cable" to refer to the same cable, causing antecedent basis problems.

Regarding claim 42, it is unclear in its given context how a cable comprises individual sensor elements. As understood, the sensor comprises individual sensor elements. Further, it is unclear how the cable in the preamble is related to the cable in the body of the claim. Also, in the preamble "each individual optical fiber" lacks proper antecedent basis. In addition, it is unclear how a shape and an area of the sensor of the preamble are related to a shape and an area of the sensor in the body of the claim.

#### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2878

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-9, 18, 19, 27, 28, 31 and 33, are rejected under 35 U.S.C. 102(b) as being anticipated by Harootian, Jr. (U.S. Patent 5,303,373), hereinafter, Harootian.

Regarding claims 1-9, 18, 19, 27, 28, 31 and 33, Harootian discloses (see Fig. 1) an apparatus, comprising: a fiber optic cable (bundle 5, not labeled) comprised individual optical fibers, the cable having a first end with a first shape (circular) and a first area, and a second end having a second shape (square) other than the first shape (see claim 6) and a second area; a sensor (CCD; see col. 4, line 20) comprised of individual sensor elements, the sensor having substantially the same shape and area as the second end without inscribing a circular image onto the shape of the sensor; and an optical system (see col. 4, lines 20-30) that produces an image. Each fiber or sensor element is assigned to one or more sensor elements or fibers, respectively.

8. Claims 35-37 and 39-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Migliaccio (UK Patent Application GB 2,277,809).

Regarding claims 35-37 and 39, Migliaccio discloses (see Fig. 2) a method, comprising: generating an image (with lenses) comprising individual pixels, the generated image having a first geometric shape (curve at 16) and having a first surface area; and conveying the generated image through a non-tapered bundle of optical fibers

Art Unit: 2878

(28) comprising a plurality of individual fibers, the bundle having a first end (at 24) and a second end (at 26), in which the first end is adapted to conform substantially with the first geometric shape (curve) of the generated image and to cover at least a portion of the first surface area, and the second end is adapted to conform to a second geometric shape (linear) that is other than the first geometric shape but which has a second surface area corresponding substantially to that portion of the first surface area covered by the first end, provided that the first geometric shape does not include a straight line and a cross-sectional geometry of the first end (a doughnut shape) differs from that of the second end. Migliaccio further discloses (see page 6, line 10) projecting the conveyed image onto a sensor array (CCD) comprising a plurality of individual sensor elements and a coherent bundle. Furthermore, loss of image resolution is eliminated since the image is conveyed through fibers and aberration is reduced.

Regarding claims 40 and 41, Migliaccio discloses (see Fig. 2) an apparatus for conveying a non-planar image to a planar sensor, comprising: a lens (6 or 12) that projects a non-planar image having a focal plane away from the surface of the lens; an optical fiber cable (28) comprised of individual optical fibers, the cable having a non-planar first end (at 24) and a planar second (at 26), the first end having a first area and a shape substantially identical to a shape of the non-planar image, the first end including first ends of the individual optical fibers, each fiber arrayed away from a surface of the lens and in the focal plane of the lens, the second end of the cable comprising a planar array of second ends of the individual fibers, the second end having a shape and a second area; and planar sensor (CCD; not shown) comprises of sensor

elements in communication with the second end of the cable, the sensor having a shape and area substantially identical to a shape and area of the second end.

9. Claims 35-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Karellas (U.S. Patent 5,572,034).

Regarding claims 35-39, Karellas discloses (see Fig. 4A) a method, comprising: generating an image (with lens; see Fig. 8) comprising individual pixels, the generated image having a first geometric shape (curve) and having a first surface area; and conveying the generated image through a non-tapered bundle of optical fibers (63) comprising a plurality of individual fibers, the bundle having a first end (at 61) and a second end (at 68), in which the first end is adapted to conform substantially with the first geometric shape (curve) of the generated image and to cover at least a portion of the first surface area, and the second end is adapted to conform to a second geometric shape (discontinuous line segment) that is other than the first geometric shape but which has a second surface area corresponding substantially to that portion of the first surface area covered by the first end, provided that the first geometric shape does not include a straight line and a cross-sectional geometry of the first end differs from that of the second end. Karellas further discloses (see Fig. 4) projecting the conveyed image onto a sensor array (64a-c) comprising a plurality of individual sensor elements and a coherent bundle. Karellas also disclose (see Fig. 7) an incoherent configuration. Furthermore, loss of image resolution is eliminated since the image is conveyed through fibers.

Regarding claim 40, Karellas discloses (see Figs. 4 and 8) an apparatus for



Art Unit: 2878

conveying a non-planar image to a planar sensor, comprising: a lens (not shown in Fig. 4) that projects a non-planar image having a focal plane (curve) away from the surface of the lens; an optical fiber cable (63) comprised of individual optical fibers, the cable having a first end (at 61) and a second end (at 68), the first end having a first area and a shape substantially identical to a shape of the non-planar image, the first end including first ends of the individual optical fibers, each fiber arrayed away from a surface of the lens and in the focal plane of the lens, the second end of the cable comprising a planar array of second ends of the individual fibers, the second end having a shape and a second area; and planar sensor (64a, 64b, or 64c) in communication with the second end of the cable.

10. Claim 42 is rejected under 35 U.S.C. 102(b) as being anticipated by Nakao et al. (U.S. Patent 4,707,600).

Regarding claim 42, Nakao et al. disclose (see Figs.) a method, comprising: obtaining substantially as many individual optical fibers (F1-F16) as individual sensor elements in the sensor (4); arranging each fiber into a fiber cable forming a bundle, the cable having an end that has a shape and area (linear shape) substantially identical to a shape and area of the sensor, where each optical fiber is substantially aligned with at least one sensor element when the optical fiber is in communication with the sensor.

11. Claims 1-9, 18-20, 27, 28, 31, 33 and 34, are rejected under 35 U.S.C. 102(e) as being anticipated by Tafas et al. (U.S. Patent 6,320,174).

Regarding claims 1-9, 18-20, 27, 28, 31, 33 and 34, Tafas et al. disclose (see Fig. 5) an apparatus, comprising: a fiber optic cable comprised individual optical fibers

Art Unit: 2878

(510), the cable having a first end with a first shape (circular) and a first area, and a second end having a second shape (square) other than the first shape and a second area; a sensor (coupled to 520) comprised of individual sensor elements, the sensor having substantially the same shape and area as the second end without inscribing a circular image onto the shape of the sensor; and an optical system (410, see Fig. 4) that produces an image. Each fiber or sensor element is assigned to one or more sensor elements or fibers, respectively. The optical system (410) comprises one or more lens.

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 20-26, 32 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harootian.

Regarding claim 32, Harootian discloses the claimed invention as set forth above. Harootian do not specifically disclose an incoherent configuration. However, configuring the fibers in a coherent or incoherent arrangement as desired is well known. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide an incoherent configuration in the apparatus of Harootian to obtain a desired signal.

Regarding claim 34, Harootian discloses the claimed invention as set forth above. Harootian do not specifically disclose each fiber is directly in contact with the

Art Unit: 2878

sensor elements. However, configuring the fibers to be in direct contact with a sensor element is well known. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide such a configuration in the apparatus of Harootian to obtain a more compact device.

Regarding claims 20-26, Harootian discloses the claimed invention as set forth above. Harootian does not specifically disclose a mirror. However, mirrors are well known optical systems. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide mirrors in the apparatus of Harootian to convey the optical signals more compactly. The particular shape of the mirror is a matter of design choice.

14. Claims 10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harootian in view of Migliaccio.

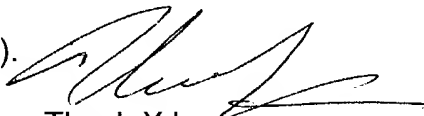
Regarding claims 10-17, Harootian discloses the claimed invention as set forth above. Harootian does not specifically disclose the first end is adapted to conform to a non-planar surface. Migliaccio teaches (see Figs.) adapting a first end to conform to a non-planar surface in order to reduce aberrations and improve imaging. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to conform the first end as claimed in the apparatus of Harootian in view of Migliaccio to improve imaging. The particular shape of the non-planar surface is a matter of design choice.

**Conclusion**

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X Luu whose telephone number is (571) 272-2441. The examiner can normally be reached on M-F (6:30-4:00) First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Thanh X Luu  
Primary Examiner  
Art Unit 2878

07/2004